UNIVERSITY OF CALIFORNIA
COLLEGE OF AGRICULTURE
AGRICULTURAL EXPERIMENT STATION
BERKELEY, CALIFORNIA

A DRYING-YARD TRAY LIFTER

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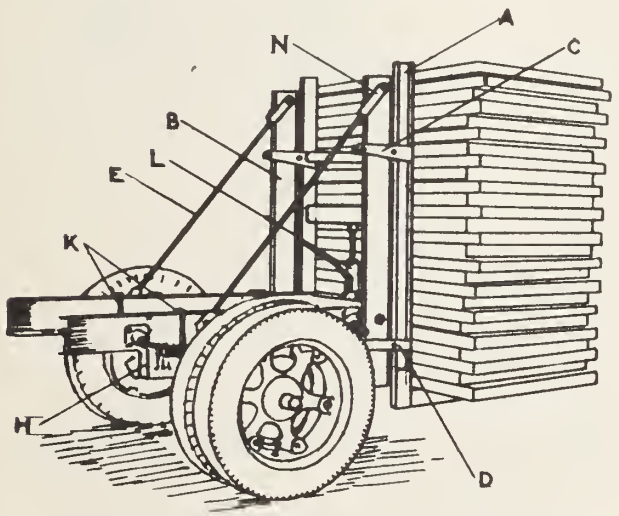
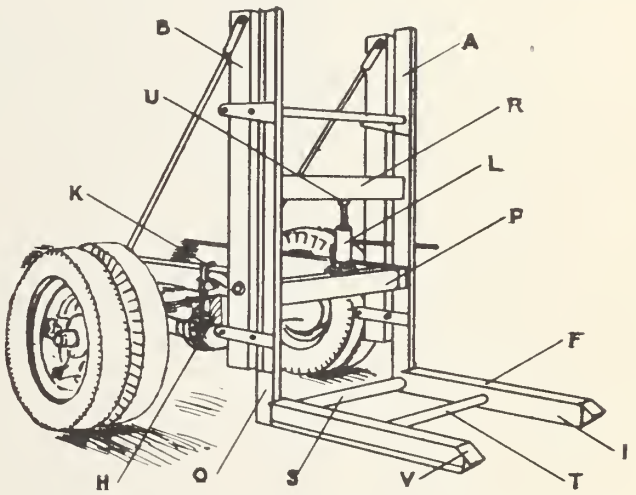
Demands for larger quantities of dried fruit have made necessary the extension of existing drying-yard areas or the development of new yards. The shortage of farm labor and the difficulties encountered in obtaining and setting up drying-yard equipment have made a definite place for the tray lifter. Its function is to eliminate additional trucks and track, and to save man-hours of labor. It is designed for mounting on a truck chassis although it may be adapted for use on the conventional wheel tractor as well, and is capable of handling a ton of trayed fruit.

CONSTRUCTION

The first sketch appearing on this page shows the lifter loaded with trays; the second drawing on page 1, together with those on pages 2, 3, and



4 show details of construction. A bill of materials also appears on page 4. The assembly consists of a lifting frame, supported by rollers on a fixed frame attached directly to the truck chassis, and moved up and down by means of a hydraulic automobile jack. The lifting frame is made of two vertical members, A, and two lifting arms, I, fastened together by the cross members R, S, and T. The joints between the vertical members and the lifting arms are reinforced with the plates O. The bearing surfaces for the trays on



the lifting arms are increased by the use of 4-inch strips, F, welded to the top edges of the channels. These strips are extended and bent to fasten to the lower edges of the channels to provide finished ends, V, to the arms. Roller brackets, C and D, are attached to the lifting frame. The rollers are cast-iron chain-tightener rollers, John Deere no. G353-D or the equivalent. These rollers are about as long as the width of the channel flanges, and run on strips welded at their ends to the fixed-frame members as shown in the drawing detail.

The fixed frame is made of the two vertical members, B, and the braces, E, with end fastenings, N and Q. The vertical members are bolted, J, to the truck frame at a point such that the lift support, P, welded across the rear of the chassis, is directly below the channel cross member of the lifting frame. The lower fastenings, Q, of the fixed-frame braces, E, are provided with bolts, W, and nuts, M, for adjusting the position of the vertical members, B. Lift stop blocks are welded to the lift frame to limit the travel and steady the load.

Wooden blocks, H, are placed between the truck frame and the rear axle housing to block the springs, and are held in place by the stirrup bolts, K.

Sizes and specifications of all parts of the

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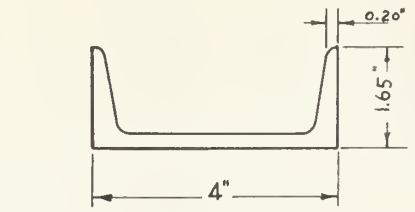
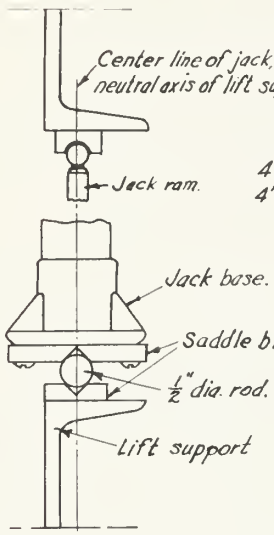
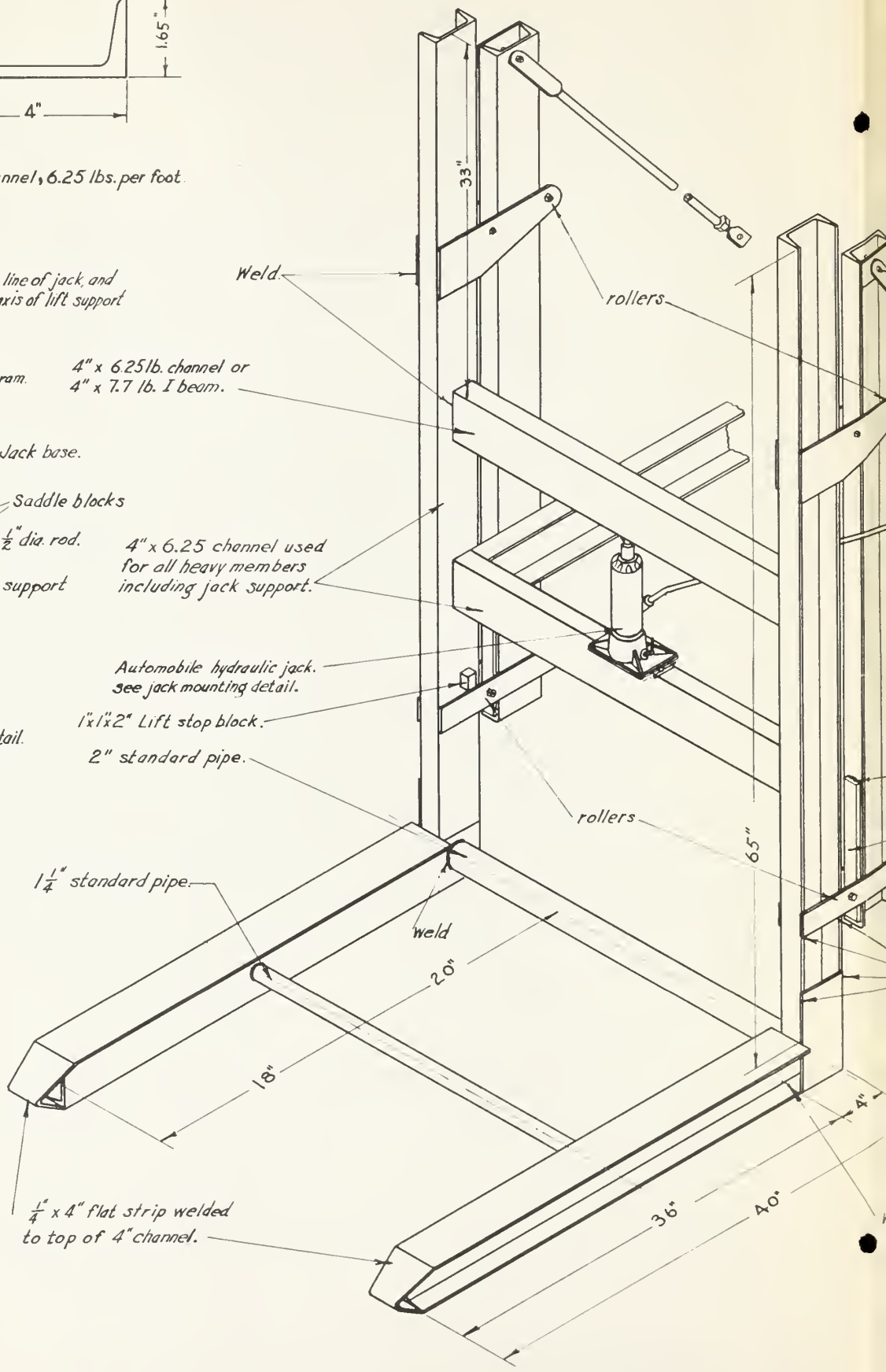


4" channel, 6.25 lbs. per foot



Jack Mounting Detail.
Scale ½" = 1"



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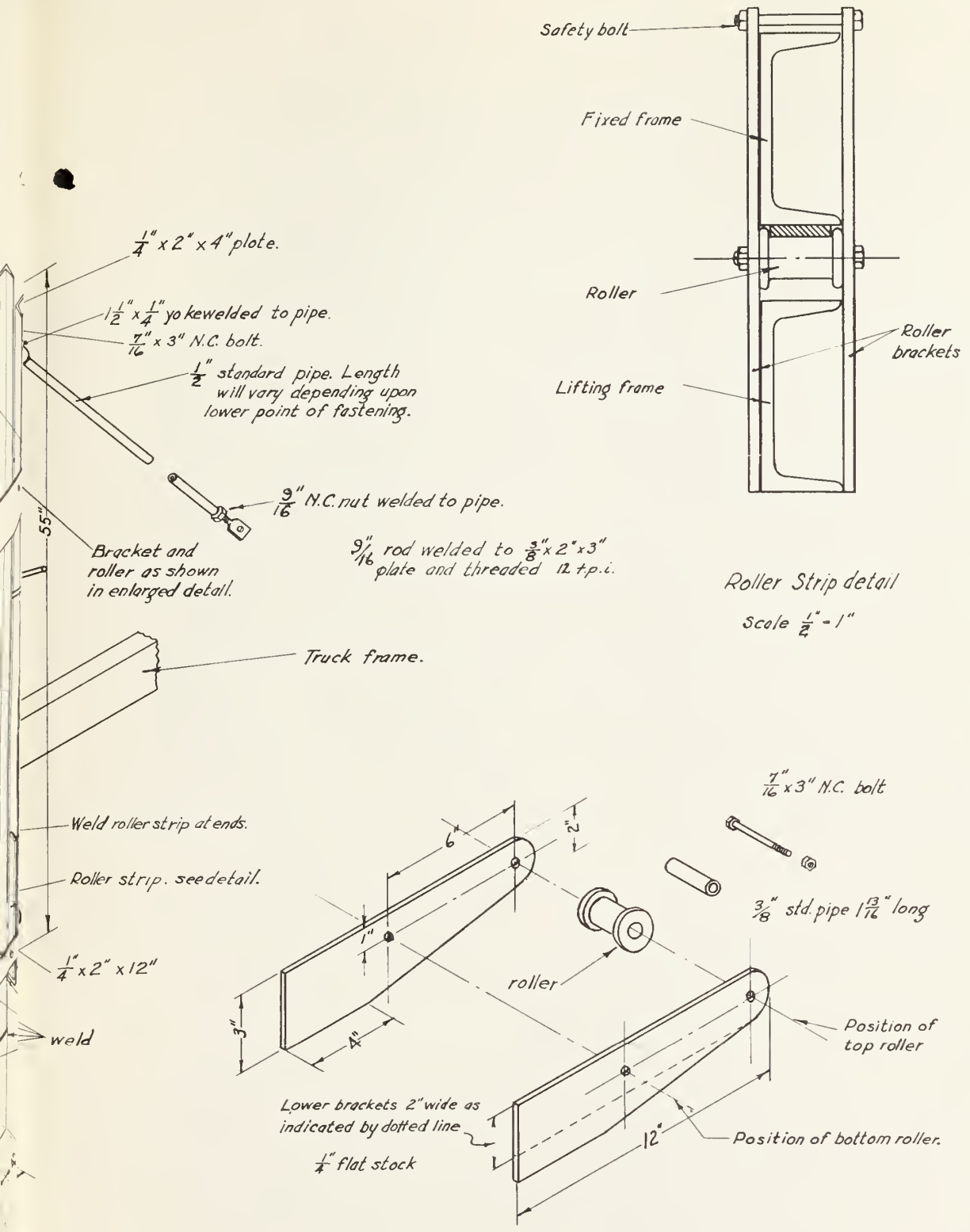

Safety bolt
Fixed frame
Roller
Roller brackets
Lifting frame
1/4" x 2" x 4" plate.
1 1/2" x 1/4" yo kewelded to pipe.
7/16" x 3" N.C. bolt.
1/2" standard pipe. Length will vary depending upon lower point of fastening.
9/16" N.C. nut welded to pipe.
55"
Bracket and roller as shown in enlarged detail.
9/16" rod welded to 3/8" x 2" x 3" plate and threaded 12 t.p.i.
Truck frame.
Weld roller strip at ends.
Roller strip. see detail.
1/4" x 2" x 12"
weld
7/16" x 3" N.C. bolt
3/8" std. pipe 1 13/16" long
6"
2"
1"
3"
4"
roller
Position of top roller
Lower brackets 2" wide as indicated by dotted line
1/4" flat stock
12"
Position of bottom roller.

Roller Strip detail

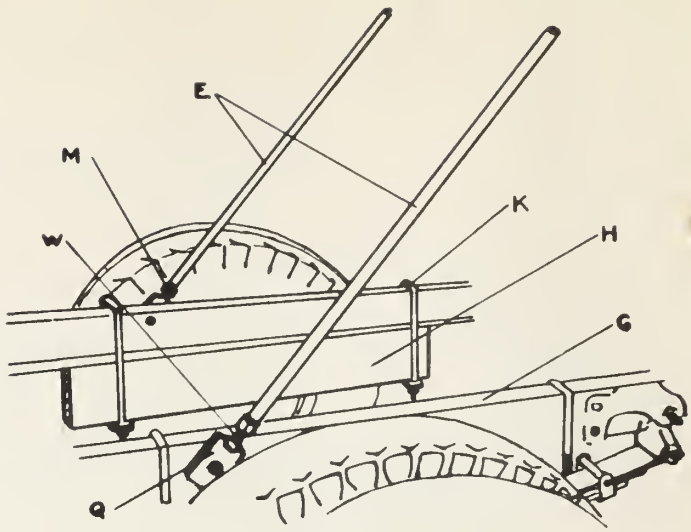
Scale 1/2" - 1"

Bracket and roller detail.

scale 1/4" = 1"

UNIVERSITY OF CALIFORNIA DIVISION OF AGRICULTURAL ENGINEERING COLLEGE OF AGRICULTURE DAVIS, CALIF.	PLAN NO. C-532. DRY-YARD TRAY LIFTER APPROVED FOR DIVISIONS OF: AGRICULTURAL ENGINEERING DRAWN BY C.L.Jr. TRACED BY C.L. CHECKED BY C.E.G. DATE

lifter except the hydraulic jack are shown in the drawing and given in the bill of materials. All joints are welded. The lengths of the cross members of the frame may be varied to fit the particular truck chassis on which the lifter is mounted. The hydraulic jack should have a capacity of at least 3,000 pounds, and a minimum travel of 6 inches. If a pump and ram are available, they may be substituted for the hydraulic jack to make the lifting operation automatic. A ball-and-socket pad, U, at the top of the jack ram, and the flexible jack mounting, are provided to insure proper application of the lifting force for different adjustments of the fixed-frame verticals, B.

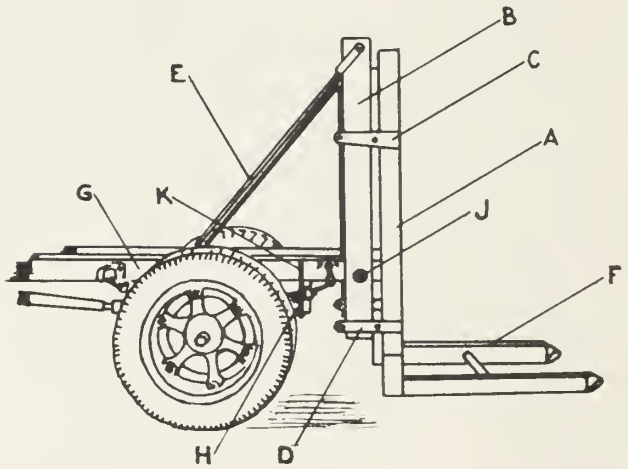


OPERATION

Trays stacked at the cutting shed can be brought to the sulfuring house, then transported to the drying yard. Trays may be spread on the ground directly from the slow-moving truck or tractor, and the operation reversed when bringing in the dired fruit. A truck equipped with compound low is desirable for this work.

Blocks, slightly higher than the lifting arms when in their lowest position, are used to stack the trays on; this permits the arms to be moved in or out under the load.

Since the width of the lift is less than the truck tread, separate sets of blocks must be provided for each row of stacked trays in the sulfuring house. Since the length of the lifting arms is longer than the width of the trays it is necessary to have a space between the two stacks of trays. Two 2 × 4 inch pieces will serve the purpose. This space will also provide better circulation during the sulfuring process.



BILL OF MATERIALS

Number and name of part	Material	Dimensions	Symbol in drawing
2 lift-frame verticals	structural channel	4" × 6.25 lb. × 65"	A
2 lifting arms	structural channel	4" × 6.25 lb. × 40"	I
1 cross member	structural channel	4" × 6.25 lb. × --*	R
1 cross member	standard iron pipe	2" nominal*	S
1 cross member	standard iron pipe	1-1/4 nominal*	T
2 fixed-frame verticals	structural channel	4" × 6.25 lb. × 55"	B
2 fixed-frame braces	standard iron pipe	1/2" nominal 60"	E
4 roller brackets	hot-rolled steel	1/4" × 3" × 12"	C
4 roller brackets	hot-rolled steel	1/4" × 2" × 12"	D
4 rollers	cast iron	----------	-
4 roller strips	cold-rolled steel	1/4" × 1-1/4" × 12"	
2 tray bearing strips	hot-rolled steel	1/4" × 4" × 44"	F
2 reinforcing plates	hot-rolled steel	1/4" × 4" × 8"	O
2 spring blocks	douglas-fir or hardwood	2" × --* × 36"	H
4 stirrup bolts	hot-rolled rod	1/2" × 30"	K
1 lift support	structural channel	4" × 6.25 lb. × --*	P
4 roller bolts	----------	7/16" × 3" NC	-
4 safety bolts	----------	7/16" × 3"	-
2 upper brace yoke bolts (mach.)	----------	7/16" × 2-1/2"	-
2 lift stops	cold-rolled steel	1" × 1" × 2"	-
2 chassis bolts	----------	3/4" × 1" NC	J
2 lower brace fastener bolts	----------	5/8" × 6" NC	W
2 upper brace yokes	hot-rolled steel	1/4" × 2" × 26"	N
2 lower brace plate	hot-rolled steel	3/8" × 2" × 4"	Q
2 lower brace plate bolts (mach.)	----------	1/2" × 1"	-
2 upper brace yoke anchor plates	hot-rolled steel	1/4" × 2" × 4"	-

*Dimension will vary for different truck chassis.

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